WHAT IS CLAIMED IS:

1. A plasma processing apparatus comprising a plurality of plasma processing units, each of the plurality of plasma processing units comprising:

a plasma processing chamber including an electrode to excite a plasma;

a radiofrequency generator to supply radiofrequency power to the electrode; and

a matching circuit to match impedances of the plasma processing chamber and the radiofrequency generator, the matching circuit having an input terminal connected to the radiofrequency generator, an output terminal connected to the electrode, and a connection point provided between the input terminal and the output terminal, the matching circuit being connected to a ground potential portion via the connection point,

wherein a variation <RA> among the plurality of plasma processing units defined by a first equation below is set at a first value within a first predetermined range:

$$\langle RA \rangle = (RA_{max} - RA_{min})/(RA_{max} + RA_{min})$$

where RA_{max} and RA_{min} are maximum and minimum values, respectively, of AC resistances RA in the matching circuits of the plurality of plasma processing units measured from an input-terminal-side of the matching circuits, and

a variation <RB> among the plurality of plasma processing units defined by a second equation below is set

at a second value within a second predetermined range:

$$\langle RB \rangle = (RB_{max} - RB_{min})/(RB_{max} + RB_{min})$$

where RB_{max} and RB_{min} are maximum and minimum values, respectively, of AC resistances RB in the matching circuits of the plurality of plasma processing units measured from an output-terminal-side of the matching circuits.

2. The plasma processing apparatus according to Claim 1, wherein the matching circuit is disconnected from the plasma processing unit at the output terminal and at the input terminal, and the AC resistance RA is measured at a first measuring point corresponding to the input terminal.

3. The plasma processing apparatus according to Claim 1, the plasma processing unit further comprising a radiofrequency supplier disposed between the radiofrequency generator and the input terminal of the matching circuit,

wherein the matching circuit is disconnected from the plasma processing unit at the output terminal and at an input end of the radiofrequency supplier, and the AC resistance RA is measured at a second measuring point corresponding to the input end of the radiofrequency supplier.

4. The plasma processing apparatus according to Claim 1, wherein the matching circuit is disconnected from the plasma processing unit at the input terminal and at the

output terminal of the matching circuit, and the AC resistance RB is measured at a third measuring point corresponding to the output terminal.

5. The plasma processing apparatus according to Claim 1, the plasma processing unit further comprising a radiofrequency feeder disposed between the output terminal of the matching circuit and the electrode,

wherein the matching circuit is disconnected from the plasma processing unit at the input terminal of the matching circuit and at an output end of the radiofrequency feeder, and the AC resistance RB is measured at a fourth measuring point corresponding to the output end of the radiofrequency feeder.

6. The plasma processing apparatus according to Claim 1, wherein the AC resistances RA and RB are values measured at a power frequency of the radiofrequency generator.

7. The plasma processing apparatus according to Claim 1, wherein both the first and second predetermined ranges are less than 0.5.

8. The plasma processing apparatus according to Claim 7, wherein both the first and second predetermined ranges are less than 0.4.

9. The plasma processing apparatus according to Claim 1, the matching circuit further comprising at least one connection point to connect the matching circuit to the ground potential portion,

wherein the AC resistances RA and RB are measured for each of the connection points by sequentially switching the connection points so that only one of the connection points is connected to the ground potential portion.

10. A performance validation system for a plasma processing apparatus, the system comprising:

a customer terminal;

an engineer terminal; and

an information provider,

wherein the customer terminal requests the information provider via a public line to view performance information indicating a state of operation of the plasma processing apparatus according to Claim 1 which a customer purchased from an engineer;

the engineer uploads the performance information through the engineer terminal; and

the information provider provides the performance information uploaded through the engineer terminal to the customer terminal upon the request from the customer terminal.

11. The performance validation system for a plasma

processing apparatus according to Claim 10, wherein the performance information contains information on the variations <RA> and <RB> in the AC resistances RA and RB.

12. The performance validation system for a plasma processing apparatus according to Claim 11, wherein the performance information is output as one of a catalog and a specification document.

13. A plasma processing system including a plurality of plasma processing apparatuses, each of the plasma processing apparatuses including a plurality of plasma processing units, each of the plasma processing units comprising:

a plasma processing chamber including an electrode to excite a plasma;

a radiofrequency generator to supply radiofrequency power to the electrode; and

a matching circuit to match impedances of the plasma processing chamber and the radiofrequency generator, the matching circuit having an input terminal connected to the radiofrequency generator, an output terminal connected to the electrode, and a connection point provided between the input terminal and the output terminal, the matching circuit being connected to a ground potential portion via the connection point,

wherein a variation <RA> among the plurality of plasma

processing units defined by a first equation below is set at a value within a predetermined range:

$$\langle RA \rangle = (RA_{max} - RA_{min})/(RA_{max} + RA_{min})$$

where RA_{max} and RA_{min} are maximum and minimum values, respectively, of AC resistances RA in the matching circuits of the plurality of plasma processing units measured from an input-terminal-side of the matching circuits, and

a variation <RB> among the plurality of plasma processing units defined by a second equation below is set at a value within a predetermined range:

$$\langle RB \rangle = (RB_{max} - RB_{min})/(RB_{max} + RB_{min})$$

where RB_{max} and RB_{min} are maximum and minimum values, respectively, of AC resistances RB in the matching circuits of the plurality of plasma processing units measured from an output-terminal-side of the matching circuits.

14. The plasma processing system according to Claim 13, wherein the matching circuit is disconnected from the plasma processing unit at the output terminal and at the input terminal, and the AC resistance RA is measured at a first measuring point corresponding to the input terminal.

15. The plasma processing system according to Claim 13, the plasma processing unit further comprising a radiofrequency supplier disposed between the radiofrequency generator and the input terminal of the matching circuit,

wherein the matching circuit is disconnected from the

plasma processing unit at the output terminal and at an input end of the radiofrequency supplier, and the AC resistance RA is measured at a second measuring point corresponding to the input end of the radiofrequency supplier.

16. The plasma processing system according to Claim 13, wherein the matching circuit is disconnected from the plasma processing unit at the input terminal and at the output terminal of the matching circuit, and the AC resistance RB is measured at a third measuring point corresponding to the output terminal.

17. The plasma processing system according to Claim 13, the plasma processing unit further comprising a radiofrequency feeder disposed between the output terminal of the matching circuit and the electrode,

wherein the matching circuit is disconnected from the plasma processing unit at the input terminal of the matching circuit and at an output end of the radiofrequency feeder, and the AC resistance RB is measured at a fourth measuring point corresponding to the output end of the radiofrequency feeder.

18. The plasma processing system according to Claim 13, wherein the AC resistances RA and RB are values measured at a power frequency of the radiofrequency generator.

19. The plasma processing system according to Claim 13, wherein both the first and second predetermined ranges are less than 0.5.

20. The plasma processing system according to Claim 19, wherein both the first and second predetermined ranges are less than 0.4.

21. The plasma processing system according to Claim 13, the matching circuit further comprising at least one connection point to connect the matching circuit to the ground potential portion,

wherein the AC resistances RA and RB are measured for each of the connection points by sequentially switching the connection points so that only one of the connection points is connected to the ground potential portion.

22. A performance validation system for a plasma processing system, the performance validation system comprising:

a customer terminal;

an engineer terminal; and

an information provider,

wherein the customer terminal requests the information provider via a public line to view performance information indicating the state of operation of the plasma processing

system according to Claim 13 which a customer purchased from an engineer;

the engineer uploads the performance information through the engineer terminal; and

the information provider provides the performance information uploaded through the engineer terminal to the customer terminal upon the request from the customer terminal.

23. The performance validation system for a plasma processing system according to Claim 22, wherein the performance information contains information on the variations <RA> and <RB> in the AC resistances RA and RB.

24. The performance validation system for a plasma processing system according to Claim 22, wherein the performance information is output as one of a catalog and a specification document.

25. An inspection method for a plasma processing apparatus including a plurality of plasma processing units, each of the plurality of plasma processing units comprising: a plasma processing chamber including an electrode to excite a plasma; a radiofrequency generator to supply radiofrequency power to the electrode; and a matching circuit to match impedances of the plasma processing chamber and the radiofrequency generator, the matching circuit

having an input terminal connected to the radiofrequency generator, an output terminal connected to the electrode, and a connection point provided between the input terminal and the output terminal, the matching circuit being connected to a ground potential portion via the connection point,

the method comprising:

inspecting whether a variation <RA> among the plurality of plasma processing units defined by a first equation below is within a first predetermined range:

$$\langle RA \rangle = (RA_{max} - RA_{min})/(RA_{max} + RA_{min})$$

where RA_{max} and RA_{min} are maximum and minimum values, respectively, of AC resistances RA in the matching circuits of the plurality of plasma processing units measured from an input-terminal-side of the matching circuits; and

inspecting whether a variation <RB> among the plurality of plasma processing units defined by a second equation below is within a second predetermined range:

$$\langle RB \rangle = (RB_{max} - RB_{min})/(RB_{max} + RB_{min})$$

where RB_{max} and RB_{min} are maximum and minimum values, respectively, of AC resistances RB in the matching circuits of the plurality of plasma processing units measured from an output-terminal-side of the matching circuits.

26. The inspection method for a plasma processing apparatus according to Claim 25, wherein the matching circuit is disconnected from the plasma processing unit at

the output terminal and at the input terminal, and the AC resistance RA is measured at a first measuring point corresponding to the input terminal.

27. The inspection method for a plasma processing apparatus according to Claim 25, the plasma processing unit further comprising a radiofrequency supplier disposed between the radiofrequency generator and the input terminal of the matching circuit,

wherein the matching circuit is disconnected from the plasma processing unit at the output terminal and at an input end of the radiofrequency supplier, and the AC resistance RA is measured at a second measuring point corresponding to the input end of the radiofrequency supplier.

28. The inspection method for a plasma processing apparatus according to Claim 25, wherein the matching circuit is disconnected from the plasma processing unit at the input terminal and at the output terminal of the matching circuit, and the AC resistance RB is measured at a third measuring point corresponding to the output terminal.

29. The inspection method for a plasma processing apparatus according to Claim 25, the plasma processing unit further comprising a radiofrequency feeder disposed between the output terminal of the matching circuit and the

electrode,

wherein the matching circuit is disconnected from the plasma processing unit at the input terminal of the matching circuit and at an output end of the radiofrequency feeder, and the AC resistance RB is measured at a fourth measuring point corresponding to the output end of the radiofrequency feeder.

30. The inspection method for a plasma processing apparatus according to Claim 25, wherein the AC resistances RA and RB are values measured at a power frequency of the radiofrequency generator.

31. The inspection method for a plasma processing apparatus according to Claim 25, wherein both the first and second predetermined ranges are less than 0.5.

32. The inspection method for a plasma processing apparatus according to Claim 31, wherein both the first and second predetermined ranges are less than 0.4.

33. The inspection method for a plasma processing apparatus according to Claim 25, the matching circuit further comprising at least one connection point to connect the matching circuit to the ground potential portion,

wherein the AC resistances RA and RB are measured for each of the connection points by sequentially switching the

connection points so that only one of the connection points is connected to the ground potential portion.

34. A inspection method for a plasma processing system including a plurality of plasma processing apparatuses, each of the plasma processing apparatuses including a plurality of plasma processing units, each of the plasma processing units comprising: a plasma processing chamber including an electrode to excite a plasma; a radiofrequency generator to supply radiofrequency power to the electrode; and a matching circuit to match impedances of the plasma processing chamber and the radiofrequency generator, the matching circuit having an input terminal connected to the radiofrequency generator, an output terminal connected to the electrode, and a connection point provided between the input terminal and the output terminal, the matching circuit being connected to a ground potential portion via the connection point,

the method comprising:

inspecting whether a variation <RA> among the plurality of plasma processing units defined by a first equation below is within a first predetermined range:

$$\langle RA \rangle = (RA_{max} - RA_{min})/(RA_{max} + RA_{min})$$

where RA_{max} and RA_{min} are maximum and minimum values, respectively, of AC resistances RA in the matching circuits of the plurality of plasma processing units measured from an input-terminal-side of the matching circuits; and

inspecting whether a variation <RB> among the plurality of plasma processing units defined by a second equation below is within a second predetermined range:

$$\langle RB \rangle = (RB_{max} - RB_{min}) / (RB_{max} + RB_{min})$$

where RB_{max} and RB_{min} are maximum and minimum values, respectively, of AC resistances RB in the matching circuits of the plurality of plasma processing units measured from an output-terminal-side of the matching circuits.

35. The inspection method for a plasma processing system according to Claim 34, wherein the matching circuit is disconnected from the plasma processing unit at the output terminal and at the input terminal, and the AC resistance RA is measured at a first measuring point corresponding to the input terminal.

36. The inspection method for a plasma processing system according to Claim 34, the plasma processing unit further comprising a radiofrequency supplier disposed between the radiofrequency generator and the input terminal of the matching circuit,

wherein the matching circuit is disconnected from the plasma processing unit at the output terminal and at an input end of the radiofrequency supplier, and the AC resistance RA is measured at a second measuring point corresponding to the input end of the radiofrequency supplier.

37. The inspection method for a plasma processing system according to Claim 34, wherein the matching circuit is disconnected from the plasma processing unit at the input terminal and at the output terminal of the matching circuit, and the AC resistance RB is measured at a third measuring point corresponding to the output terminal.

38. The inspection method for a plasma processing system according to Claim 34, the plasma processing unit further comprising a radiofrequency feeder disposed between the output terminal of the matching circuit and the electrode,

wherein the matching circuit is disconnected from the plasma processing unit at the input terminal of the matching circuit and at an output end of the radiofrequency feeder, and the AC resistance RB is measured at a fourth measuring point corresponding to the output end of the radiofrequency feeder.

39. The inspection method for a plasma processing system according to Claim 34, wherein the AC resistances RA and RB are values measured at a power frequency of the radiofrequency generator.

40. The inspection method for a plasma processing system according to Claim 34, wherein both the first and

second predetermined ranges are less than 0.5.

41. The inspection method for a plasma processing system according to Claim 40, wherein both the first and second predetermined ranges are less than 0.4.

42. The inspection method for a plasma processing system according to Claim 34, the matching circuit further comprising at least one connection point to connect the matching circuit to the ground potential portion,

wherein the AC resistances RA and RB are measured for each of the connection points by sequentially switching the connection points so that only one of the connection points is connected to the ground potential portion.